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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/785,759	02/16/2001	Ranjit Gharpurey	TI-31261	2970

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EXAMINER	
YUN, EUGENE	

ART UNIT	PAPER NUMBER
2618	

NOTIFICATION DATE	DELIVERY MODE
02/07/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	09/785,759	GHARPUREY, RANJIT	
	Examiner	Art Unit	
	Eugene Yun	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 November 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,5,7,10,11 and 13-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,5,7,10,11 and 13-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 March 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 4, 5, 7, 10, 11, and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morishige et al. (US 6,600,911) and Matero (US 6,215,988) and further in view of Moore (US 4,766,392).

Referring to Claim 1, Morishige teaches a frequency division duplexed (FDD) radio (see col. 3, lines 53-67 noting that the general definition of a FDD radio is a radio which transmits at a different frequency than it receives a signal), comprising:

a duplexer 17 (fig. 2);

a transmitter section 22 (fig. 2) coupled to the duplexer, the transmitter section transmitting in a transmit frequency band having a center frequency; and

a receiver section 21 (fig. 2) coupled to the transmitter section, for receiving a signal at a receive frequency that is different from the transmit band center frequency (see col. 3, lines 53-67 noting that the difference is 1/2) the receiver section including a down conversion section 4 (fig. 2) comprising first and second mixers (see the two mixers inside 4 of fig. 2).

Morishige does not teach mixers receiving a local oscillator (LO) signal having a frequency equal to the transmit band center frequency or a sub-harmonic thereof. Matero teaches mixers receiving a local oscillator (LO) signal having a frequency equal to the transmit band center frequency or a sub-harmonic thereof (see col. 8, lines 17-22). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Matero to said method of Morishige in order to better reduce the interference in the radio.

The combination of Morishige and Matero does not teach a first high pass filter coupled to the output of the first mixer, and having an output;

a second high pass filter coupled to the output of the second mixer, and having an output;

a first set of two mixers coupled to the output of the first high pass filter; and

a second set of two mixers coupled to the output of the second high pass filter.

Moore teaches a first high pass filter 15 (fig. 1) coupled to the output of the first mixer 2 (fig. 1), and having an output;

a second high pass filter 16 (fig. 1) coupled to the output of the second mixer 3 (fig. 1), and having an output;

a first set of two mixers 22 and 37 (fig. 1) coupled to the output of the first high pass filter; and

a second set of two mixers 25 and 40 (fig. 1) coupled to the output of the second high pass filter.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Moore to the modified method of Morishige and Matero in order to better reduce distortion during demodulation.

Referring to Claims 4 and 10, Moore also teaches integrated DC blocking capacitors (see 17 and 19 of fig. 1).

Referring to Claims 5 and 11, Moore also teaches cascaded single pole high pass filters (see col. 3, lines 55-59).

Referring to Claim 7, Moore also teaches a first mixer of the first set of two mixers providing an in-phase component at an output 2 (fig. 1) and a second mixer of the first set of two mixers providing a quadrature component at an output 3 (fig. 1) and further comprising:

a first adder 43 (fig. 1) having a first input for receiving the output of the second mixer of the first set of two mixers, and a second input for receiving the output of the first mixer of the second set of two mixers, said first adder having an output for providing an in-phase component base band signal (see col. 4, lines 30-34); and

a second adder 44 (fig. 1) having a first input for receiving the output of the first mixer of the first set of two mixers, and a second input for receiving the output of the second mixer of the second set of two mixers, said second adder having an output for providing a quadrature component base band signal (see col. 4, lines 30-34).

Referring to Claim 13, Moore also teaches the first high pass filter 15 (fig. 1) passing frequencies including an intermediate frequency corresponding to a difference

between the center frequency of the receiver section and the center frequency (see col. 4, lines 24-30); and

a second high pass filter 16 (fig. 1) passing frequencies including an intermediate frequency corresponding to a difference between the center frequency of the receiver section and the transmit band center frequency (see col. 4, lines 24-30).

Referring to Claim 14, Morishige teaches a method of operating a receiver 21 (fig. 2) in an FDD radio (see col. 3, lines 53-67 noting that the general definition of a FDD radio is a radio which transmits at a different frequency than it receives a signal) to remove, from a desired receive signal, interference caused by a transmitter 22 (fig. 2) transmitting at a transmit center frequency, the desired receive signal having a receive center frequency that is different from the transmit center frequency, comprising the steps of:

Mixing the receive signal with a local oscillator frequency 5 (fig. 2) to provide a down-converted receive signal 4 (fig. 2).

Morishige does not teach the local oscillator frequency equal to the transmit center frequency of a sub-harmonic thereof. Matero teaches the local oscillator frequency equal to the transmit center frequency of a sub-harmonic thereof (see col. 8, lines 17-22). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Matero to said method of Morishige in order to better reduce the interference in the radio. The combination of Morishige and Matero does not teach high pass filtering the down converted receive signal and converting the high pas filtered down converted receive signal to a baseband

signal. Moore teaches high pass filtering the down converted receive signal (see 15 and 16 of fig. 1) and converting the high pass filtered down converted receive signal to a baseband signal (see fig. 1 where after the signals pass through the second mixing stage 22, 25, 37, and 40, the signal is then baseband). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Moore to the modified method of Morishige and Matero in order to better reduce distortion during demodulation.

Referring to Claim 15, Moore also teaches mixing the receive signal with the local oscillator frequency at a first phase to provide an in-phase down-converted receive signal component (see path to mixer 2 in fig. 1); and

mixing the receive signal with the local oscillator frequency at a quadrature phase, relative to the first phase, to provide a quadrature-phase down-converted receive signal component (see path through 3 to mixer 3 in fig. 1);

wherein the down-converted receive signal comprises the in-phase down-converted receive signal component and the quadrature-phase down-converted receive signal component (see col. 3, lines 41-49).

Response to Arguments

3. Applicant's arguments filed 11/19/2007 have been fully considered but they are not persuasive.

Regarding Claim 1, The applicant argues that the Matero reference does not teach mixers receiving a local oscillator (LO) signal having a frequency equal to the

transmit band center frequency or a sub-harmonic thereof. The applicant further argues that the local oscillator signal and all other devices in the cited passage is in the transmitter, not the receiver. While that may be partially true, the examiner would like to point out the following:

-referring to fig. 3, the examiner would like to show that the local oscillator signal (52) is accessible to both the transmitter and receiver, meaning that the same local oscillation frequency used for the transmitter and receiver is equal to the transmit frequency and fed to receive mixers (60 and 74).

-the claims still state that the LO signal has a frequency the same as the transmit center frequency "or a sub-harmonic thereof". Therefore, even if we take the applicant's cited passage into account:

"The synthesizer 46 operates in the 883-908 MHz band during receive and in the 890-915 MHz band during transmission.

This embodiment provides good isolation from the transmitter to the synthesizer 46, which operates in the 869.5 - 914 MHz band during receive and in the 855 - 892 MHz band during transmission (i. e., one half of the DCS frequency band).

This embodiment also provides good isolation from the transmitter to the synthesizer 46, which operates in the 942.5 - 972.5 MHz band during reception and in the 925 - 955 MHz band during transmission."

Firstly, the transmit and receive frequencies overlap meaning that in some cases, the transmit and receive frequencies can be the same. Secondly, even if in some cases the

receive LO frequency is not exactly the same as the transmit frequency, it is still equal to one-half, or a sub harmonic of the transmit frequency.

The applicant argues that the Moore reference cannot be combined with the Morishige and Matero references. The examiner believes that the references are properly combinable because not only do all three references have similar frequency conversion circuits, but replacing the band pass filters in the Morishige reference with the high pass filters in the Moore reference would benefit by reducing distortion when the signal is recovered from baseband.

For the above reasons, the examiner stands by his rejection.

The above also applies for arguments regarding Claim 14.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Yun whose telephone number is (571) 272-7860. The examiner can normally be reached on 9:00am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew D. Anderson can be reached on (571)272-4177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Eugene Yun
Examiner
Art Unit 2618

EY

MATTHEW ANDERSON
SUPERVISORY PATENT EXAMINER